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ANNEX 2

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The Energy Union's five dimensions: policy observations at Member State and EU level

to the

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL
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INVESTMENT BANK**

Second Report on the State of the Energy Union

The main observations which can be drawn from national developments during 2016 are summarised in these policy observations. They are the basis for a more in-depth analysis of Member States' policies which the Commission intends to carry out in 2017.

National Energy and Climate Plans

- A small number of Member States are already advancing on the preparation of their integrated National Energy and Climate Plan for the period 2021 to 2030, which should include the national contributions to the Energy Union objectives and the 2030 targets for energy and climate. However, most Member States still need to start this process or to move ahead more quickly.

Energy security

- In 22 Member States, total net import dependency decreased between 2005 and 2014, indicating an improvement in energy security. Such positive trends were supported by increased indigenous renewable energy production (in e.g. Austria, Estonia, Ireland, Italy, Latvia, Portugal or Spain) and by decreasing the overall energy demand also due to energy efficiency improvements. Over the same period, total net import dependency significantly increased in a few countries, due to the decline of indigenous fossil fuel production (Denmark, Poland, the United Kingdom) or the closure of nuclear plants (Lithuania). Planned infrastructure projects might also impact the energy dependence of several Member States.
- The European Union still imports more than half of its energy needs, but is making progress to diversify sources, routes and suppliers of energy. However, some Member States are still fully or predominantly dependent on supply from a single third country, notably Bulgaria, Estonia, Finland, Hungary, Lithuania and Slovakia, in particular for gas but often for oil and/or coal, too.
- New interconnections and Liquefied Natural Gas (LNG) terminals facilitated an improvement of security of gas supply over the last years. These improvements have not only been beneficial for the internal gas market, but have increased the possibility for Member States to substitute main/traditional routes in case of disruptions. Today, an increased percentage of gas demand can be satisfied through alternative channels with only two Member States remaining that could not fully substitute for the disruption of their most important gas source¹: Bulgaria and Portugal.
- There still remains a need for further improving gas interconnections between Member States (e.g. Croatia, Hungary, Romania, Bulgaria and Greece; Portugal and Spain with France) and to ensure that consumers and suppliers in all Member States have access to liquid hubs and can benefit from the Liquefied Natural Gas (LNG) and interconnection capacities that have been developed or have the potential to develop.

¹ So-called N-1 rule.

Internal energy market

Electricity infrastructure

- Electricity interconnections and the reinforcement of internal lines are needed to further integrate the internal electricity market, e.g. in South Western Europe and in Northern and Central-Eastern Europe (e.g. Germany, Poland and the Czech Republic), or to work towards the synchronisation of the Baltic States with the European electricity system. 11 Member States have not yet reached the 2020 electricity interconnection target of 10 % (Bulgaria, Cyprus, Germany, Spain, France, Ireland, Italy, Poland, Portugal, Romania and the United Kingdom) and need to continue their efforts. In some Member States, the recent increase in installed renewable generation capacity has been quicker than the increase in interconnection capacity, making these countries undershoot the interconnection target.
- Congestion management remains an issue for seven Member States (Austria, Czech Republic, Denmark, Germany, Hungary, Poland and Slovakia). This needs a solution that will facilitate cross-border electricity flows in Central Europe and across the Union while ensuring system security.

Wholesale markets

- Many Member States have made good progress in opening up their wholesale markets to competition, and this has had significant benefits. However, there are large differences between Member States, and many of them have not yet fully implemented the necessary rules that allow for competitive and liquid markets, particularly for wholesale gas markets. Furthermore, undertakings still have significant market power in a number of Member States. Competition enforcement therefore remains key to ensure open and competitive markets.
- At the regional level, by mid-2015 most of the European wholesale electricity markets are coupled to one or several of their neighbours. Largely driven by falling coal and gas prices, the gradual penetration of renewables into the power sector and subdued demand, wholesale electricity prices decreased in most Member States between 2013 and 2015. Regional differences remained significant, with the highest prices in the United Kingdom and Southern Europe and the lowest prices in the Scandinavian countries.
- Wholesale prices of gas decreased in all Member States between 2013 and 2015, as weak demand, oversupply in the main regional markets, low oil prices and steady Liquefied Natural Gas (LNG) imports put pressure on European gas prices. In contrast to electricity, there has been a clear convergence of national prices, facilitated by lower oil prices which allowed oil-indexed prices to approximate Northwest European hub prices.

Retail markets and consumers

- Unlike wholesale prices, retail prices of gas and electricity generally increased in the last 5 years. In case of electricity, the increasing share of taxes and levies in the retail price contributed to this trend. Retail markets for both electricity and gas are still national (or sub-national). Further efforts are needed to advance regional market integration. Competition enforcement may be required in some cases.

- While several more Member States have recently moved away from end-user price regulation (Ireland, Latvia), prices for households remain regulated to different degrees in about half of the Member States which constitutes an obstacle to demand-side participation and retail competition.
- Consumer empowerment via the roll-out of smart metering has been effectively implemented only in some Member States (most notably Finland, Italy, Sweden and Malta). In Estonia, Spain and Denmark about half of households are already equipped with electricity smart meters. As regards penetration rates for gas smart meters, only the Netherlands has made some significant progress, with almost 30% of households having smart meters. In several Member States, administrative burdens act as barriers for consumers aiming to switch to new suppliers and better contractual conditions.
- Energy poverty is a concern for many Member States. On average, in the European Union, low-income households spent 8.6% of their expenditures for energy-related purposes. Moreover, this share increased for most Member States since 2005. In addition, a growing share of these households (23% in 2015) does not have sufficient financial means to heat their homes to an adequately warm level. More focused measures are needed by Member States for vulnerable consumers to address energy and fuel poverty effectively.

Energy efficiency

- Considerable progress has been made with regard to energy efficiency. In 2014, the primary energy consumption² of the European Union was only 1.6% above its primary energy consumption target for 2020, and the final energy consumption³ in 2014 was already lower than the target agreed for 2020. Even if primary and final energy consumption are expected to have increased by around 1.5% and 2%, respectively, in 2015 compared to 2014, the 2020 targets can be met, provided the necessary measures are put in place.
- Energy efficiency policies are considerably contributing to a decrease in energy consumption and decarbonisation, and can also contribute to better air quality. Increased efforts are needed to renovate existing buildings in order to reduce the overall energy consumption, energy bills of consumers and make the European Union's building stock smarter and more sustainable. In this respect, financing conditions of energy efficiency investments need to be further improved in Member States, including by consolidating synergies between project promoters and financiers as well as promoting project aggregation. New skills and information and communication technology (ICT) have great potential to contribute to improving energy efficiency. Further improvements of energy efficiency in the transport sector to exploit remaining potentials are needed in most Member States.

² 'Primary energy consumption' means gross inland consumption, excluding non-energy uses; Article 3(2) of the Energy Efficiency Directive.

³ 'Final energy consumption' means all energy supplied to industry, transport, households, services and agriculture. It excludes deliveries to the energy transformation sector and the energy industries themselves; Article 3(3) of the Energy Efficiency Directive.

Decarbonisation

- 27 Member States have emissions below their annual limits in 2013 and 2014 under the Effort Sharing Decision⁴. Only Malta's emissions exceeded the limit for these two years.
- According to their projections based on policies already implemented, most Member States are expected to reach their Effort Sharing Decision targets in 2020. A few Member States still need to put in place additional measures or to make use of flexibilities in 2020. This is in particular the case for Ireland, Luxembourg and Belgium.
- An important contribution to Energy Union actions in the European Union comes from revenues that Member States generate from auctioning emission allowances under the European Union emissions trading system (ETS). Over the period 2013-2015 these auctions generated nearly EUR 11.8 billion. Member States have used or plan to use approximately 80% of these revenues for climate and energy purposes. Member States use most of these revenues domestically for renewable energy (EUR 2.89 billion), energy efficiency (EUR 1.96 billion), and sustainable transport (EUR 730 million).
- All but one Member State (the Netherlands) exhibited average 2013/2014 renewable energy shares which were equal or higher than their corresponding indicative trajectory according to the Renewables Directive. According to estimates⁵, 25 Member States already exceeded their 2015/2016 indicative trajectories in 2015. Three Member States (France, the Netherlands and Luxembourg) showed 2015 estimated renewable energy shares below their 2015/2016 indicative trajectory.
- However, Member States will have to continue, and several Member States to strengthen efforts to reach their 2020 binding targets, as the trajectory becomes steeper closer to 2020.
- Infrastructure for alternative fuels in transport is a key enabler for low-emission mobility. Under the Alternative Fuels Directive⁶, Member States are required to submit national policy frameworks for alternative fuel infrastructure by November 2016. The majority of Member States has not met this obligation yet.

Research, innovation and competitiveness

- European industry, research institutes and academic innovative actors are overall well positioned in the global energy landscape. With 30% of global patents in renewables, the European Union is a leader in low carbon key technology innovation. More is however needed to quickly and successfully bring these innovations to the market and turn them into growth and job opportunities by addressing internal and export markets.
- The latest figures dated 2014 show that total research and innovation investment (public and private) in the EU28 has increased by 22% since 2010 in Energy Union research and innovation priorities. The private sector is responsible for this increase with the

⁴ According to the Effort Sharing Decision (ESD), Member States need to meet binding annual greenhouse gas emission limits for the period 2013–2020 in sectors not covered by the European Union emissions trading system (ETS), such as buildings, transport, waste and agriculture.

⁵ See the Renewable Energy Progress Report (COM(2017) 57) as well as the European Environment Agency's projections report (<http://www.eea.europa.eu/publications/trends-and-projections-in-europe>).

⁶ Directive 2014/94/EU on the deployment of alternative fuels infrastructure.

sustainable transport sector representing the highest share of all private investment with 43%. Public national investment has slightly decreased in this period, except in the sector of smart energy system, both in absolute terms and as a share of the Gross Domestic Product (GDP). Public investment now only represents 15% of the total overall investment.

- Compared to its main economic partners, the European manufacturing industry had in 2014 the second lowest real unit energy costs⁷ as a percentage of value added, just after the USA. China, Russia, Japan and Australia show substantially higher values than the European Union. The good performance of the European Union is mostly explained by the low levels of energy intensity of the manufacturing sector which has helped to compensate higher real energy prices.

⁷ See the key indicators report (SWD(2017) 32) for more details.